

What is claimed is:

- Sub A1*
1. A late blight-resistant potato plant comprising a segment of a genome from *Solanum bulbocastanum* which comprises a gene that confers said resistance to late blight.
  2. The potato plant of claim 1, wherein the segment of the *Solanum bulbocastanum* genome is a segment of chromosome 8 of the genome.
  3. The potato plant of claim 1, wherein the gene conferring the late blight resistance co-segregates with a marker selected from the group consisting of a GO2<sub>586</sub> RAPD marker, a PO9<sub>587</sub> RAPD marker, a CT88 RFLP marker, a CT148 RFLP marker, a CT252 RFLP marker and a CT68 RFLP marker.
  - Sub A2* 4. The potato plant of claim 4 wherein the marker comprises a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4 AND SEQ ID NO:5.
  5. The potato plant of claim 1, which is also resistant to at least one additional disease selected from the group consisting of potato early blight, *Erwinia* soft rot, and *Verticillium* wilt.
  6. The potato plant of claim 1, wherein the late blight resistance gene is incorporated into the plant by somatic hybridization between a cell of a parent of the plant and a cell of *Solanum bulbocastanum*.
  - Sub B1* 7. The potato plant of claim 1, wherein the late blight resistance gene is incorporated into the plant by genetic transformation of a cell of the plant with a plant transforming vector comprising the gene.

Sub  
A3 8. An isolated nucleic acid molecule which is complementary to part or all of a double-stranded molecule selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2 and SEQ ID NO:5.

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9. The nucleic acid molecule of claim 8, disposed within a vector.

10. A method of monitoring late blight resistance in a breeding cross of progeny of a fertile somatic hybrid of *Solanum tuberosum* and *Solanum bulbocastanum*, which comprises:

(a) performing the cross;

(b) isolating genomic DNA from

15 individual progeny of the cross; and

(c) detecting in the genomic DNA the presence or absence of a genetic marker that is pre-determined to co-segregate with the late blight resistance, the presence or absence of the marker being

20 indicative of the presence or absence of the late blight resistance in the individual progeny of the breeding cross.

11. The method of claim 10, wherein the marker is selected from the group consisting of a GO2<sub>586</sub> RAPD marker, a PO9<sub>587</sub> RAPD marker, a CT88 RFLP marker, a CT148 RFLP marker, a CT252 RFLP marker and a CT68 RFLP marker.

12. A method of identifying a *Solanum bulbocastanum* gene that confers resistance to late blight, said method comprising:

(a) cloning a DNA segment that co-segregates with the late blight resistance phenotype in progeny of somatic hybrids of *Solanum bulbocastanum* and

35 *Solanum tuberosum*;

(b) providing a genomic library of the *Solanum bulbocastanum* genome;

(c) isolating clones of the genomic library that contain segments which hybridize with the co-segregating DNA segment; and

(d) identifying at least one gene  
5 disposed within the isolated genomic clones that confer the late blight resistance.

13. The method of claim 12, wherein said cloned DNA segment that co-segregates with late blight  
10 resistance comprises part or all of a marker selected from the group consisting of a GO2<sub>586</sub> RAPD marker, a PO9<sub>587</sub> RAPD marker, a CT88 RFLP marker, a CT148 RFLP marker, a CT252 RFLP marker and a CT68 RFLP marker.

15 14. A late blight resistance gene from *Solanum bulbocastanum*, produced by the method of claim 12.

20 15. A transgenic plant comprising the gene of claim 14.

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